

AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 7 and 17; and add new claims 20-28 as follows:

LISTING OF CLAIMS

1. (currently amended) An air conditioner for a vehicle, comprising:

an air conditioning unit for performing air conditioning of a passenger compartment of the vehicle, the air conditioning unit including an operation portion that being operated operable in the air conditioning;

an environmental-condition detecting device for detecting an environmental condition of the vehicle;

[[a]] control characteristic memory means for storing a control characteristic showing a relationship between the environmental condition detected by the environmental-condition detecting device and a control value applied to the operation portion; [[and]]

a control unit for controlling operation of the operation portion based on the control characteristic stored in the control characteristic memory means, by using the environmental condition detected by the environmental-condition detecting device[[,]]; and

a manual setting device for manually setting the control value of the operation portion,

wherein the environmental-condition detecting device includes a surface temperature detecting means for detecting at least one of an inner surface temperature of the passenger compartment and a surface temperature of a passenger as the

environmental condition, in each of plural detection area of areas of the passenger compartment[[.]];

the control unit calculates a solar radiation thermal load based on a temperature of at least an area close to a window of the vehicle, among temperatures of the plural detection areas detected by the surface temperature detecting means;

the control characteristic memory means stores plural control values as control characteristics applied to the operation portion in accordance with the solar radiation thermal load; and

when the manual setting device manually changes a control value of the operation portion at a time, the control unit changes a control value calculated based on the solar radiation thermal load at the time, among the plural control values stored in the control characteristic memory means.

2. (original) The air conditioner according to claim 1, wherein the control unit controls the operation portion by using the surface temperature detected by the surface temperature detecting means in each detection area of the passenger compartment, so as to perform air conditioning of the passenger compartment for every passenger seat.

3. (original) The air conditioner according to claim 1, further comprising a manual setting device for manually setting the control value applied to the operation portion,

wherein the control unit has a control-characteristic changing means for changing the control characteristic stored in the control characteristic memory means

when the control value is manually changed by the manual setting device in a given environmental condition of the control characteristic.

4. (original) The air conditioner according to claim 1, wherein:

the control unit calculates a solar radiation thermal load based on the surface temperature detected by the surface temperature detecting means in each detection area of the passenger compartment; and

the control characteristic memory means stores a relationship between the solar radiation thermal load and the control value applied to the operation portion, as the control characteristic.

5. (original) The air conditioner according to claim 1, wherein:

the environmental-condition detecting device includes a solar radiation amount detecting means for detecting a solar radiation amount radiated into the passenger compartment;

the control unit calculates a solar radiation thermal load based on the surface temperature detected by the surface temperature detecting means in each detection area of the passenger compartment and the solar radiation amount detected by the solar radiation amount detecting means; and

the control characteristic memory means stores a relationship between the solar radiation thermal load and the control value applied to the operation portion, as the control characteristic.

6. (original) The air conditioner according to claim 3, wherein:

the operation portion includes an air temperature adjusting device for adjusting a temperature of conditioned air to be blown into the passenger compartment;

the environmental-condition detecting device further includes a solar radiation amount detecting means for detecting a solar radiation amount radiated into the passenger compartment; and

the control characteristic memory means stores a relationship between a control value applied to the air temperature adjusting device and a first solar radiation thermal load obtained based on the solar radiation amount detected by the solar radiation amount detecting means and the surface temperature detected by the surface temperature detecting means in each detection area of the passenger compartment, as a control characteristic for controlling the air temperature adjusting device.

7. (currently amended) ~~The air conditioner according to claim 6, wherein:~~

An air conditioner for a vehicle, comprising:

an air conditioning unit for performing air conditioning of a passenger compartment of the vehicle, the air conditioning unit including an operation portion that being operated in the air conditioning;

an environmental-condition detecting device for detecting an environmental condition of the vehicle;

a control characteristic memory means for storing a control characteristic showing a relationship between the environmental condition detected by the

environmental-condition detecting device and a control value applied to the operation portion;

a manual setting device for manually setting the control value applied to the operation portion; and

a control unit for controlling operation of the operation portion based on the control characteristic stored in the control characteristic memory means, by using the environmental condition detected by the environmental-condition detecting device;
wherein

the environmental-condition detecting device includes a surface temperature detecting means for detecting at least one of an inner surface temperature of the passenger compartment and a surface temperature of a passenger, in each detection area of the passenger compartment;

the control unit has a control-characteristic changing means for changing the control characteristic stored in the control characteristic memory means when the control value is manually changed by the manual setting device in a given environmental condition of the control characteristic;

the operation portion includes an air temperature adjusting device for adjusting a temperature of conditioned air to be blown into the passenger compartment;

the environmental-condition detecting device further includes a solar radiation amount detecting means for detecting a solar radiation amount radiated into the passenger compartment;

the control characteristic memory means stores a relationship between a control value applied to the air temperature adjusting device and a first solar radiation

thermal load obtained based on the solar radiation amount detected by the solar radiation amount detecting means and the surface temperature detected by the surface temperature detecting means in each detection area of the passenger compartment, as a control characteristic for controlling the air temperature adjusting device;

the operation portion further includes a blower for blowing conditioned air of the air conditioning unit into the passenger compartment; and

the control characteristic memory means stores a relationship between a control value applied to the blower and a second solar radiation thermal load obtained from the solar radiation amount detected by the solar radiation detecting device.

8. (original) The air conditioner according to claim 1, wherein the surface temperature detecting means is an infrared rays sensor for detecting an infrared-ray intensity in each detection area.

9. (original) An air conditioner for a vehicle, comprising:

- a temperature adjusting unit for adjusting a temperature of conditioned air to be blown into a passenger compartment of the vehicle;
- a blower for blowing conditioned air into the passenger compartment;
- an area temperature detecting device for detecting temperatures in a plurality of detection areas around a passenger in the passenger compartment, the detection areas at least include an area where the temperature is changed in accordance with a solar radiation direction;

a target temperature calculating means for calculating a target air temperature based on at least a set temperature, an inside air temperature inside the passenger compartment, an outside air temperature outside the passenger compartment and a solar radiation amount that is calculated based on the temperature detected by the area temperature detecting device; and

a control means for controlling the temperature and a flow amount of conditioned air to be blown into the passenger compartment by controlling the temperature adjusting unit and the blower in accordance with the calculated target air temperature,

wherein the control means determines an air outlet mode in accordance with the calculated target air temperature.

10. (original) The air conditioner according to claim 9, wherein the area temperature detecting device is constructed with a surface temperature detecting means for detecting at least one of an inner surface temperature of the passenger compartment and a surface temperature of a passenger in each detection area of the passenger compartment.

11. (original) The air conditioner according to claim 9, wherein the area temperature detecting device is constructed with a plurality of temperature detecting elements each of which is disposed near the inner surface of the passenger compartment in detection areas of the passenger compartment.

12. (original) The air conditioner according to claim 9, wherein
the inside air temperature is an average temperature of the temperatures
in the detection areas, detected by the area temperature detecting device.

13. (original) The air conditioner according to claim 9, wherein the solar
radiation amount is obtained from an average temperature of the temperatures in the
detection areas around a windshield of a driver's seat side, detected by the area
temperature detecting device.

14. (original) The air conditioner according to claim 13, wherein
the control means calculates the solar radiation amount T_s by a formula of
 $T_s = T_{dr} - T_r - T_{am}$, in which T_{dr} is the average temperature, T_r is the inside air
temperature, T_r is the inside air temperature and T_{am} is the outside air temperature.

15. (original) The air conditioner according to claim 9, further comprising:
a temperature setting switch for manually setting a set temperature of
conditioned air to be blown into the passenger compartment; and
a learning means for learning a relationship between the outside air
temperature and the solar radiation amount which are environmental condition, and the
set temperature, when the temperature setting switch is manually operated.

16. (original) The air conditioner according to claim 15, wherein the learning means is constructed with:

a memory means for storing the learned relationship as a control characteristic;

a changing means for changing an initial set temperature to a learned set temperature in the control characteristic showing the learned relationship when the set temperature is manually changed by the temperature setting switch; and

the target-temperature calculating means for calculating a target air temperature in accordance with the learned set temperature.

17. (currently amended) The air conditioner according to claim 9, further comprising:

a solar radiation detecting means for detecting only a total amount of solar radiation radiated into the passenger compartment; and

a solar radiation amount calculating means for calculating a solar radiation amount corresponding to each of plural seat ~~[[area]]~~ areas by using the detected total amount of solar radiation and a weighted value that is obtained from the area temperature detected by the area temperature detecting device in consideration of the solar radiation direction for each respective seat area in the passenger compartment,

wherein the target-temperature calculating means calculates a target temperature of conditioned air to be blown to each seat area based on the solar radiation amount corresponding to each seat area.

18. (original) The air conditioner according to claim 17, wherein the solar radiation detecting means is constructed with a solar radiation sensor.

19. (original) The air conditioner according to claim 17, wherein the solar radiation detecting means calculates the total amount of solar radiation based on an average temperature in each detection area, detected by the area temperature detecting device.

20. (new) The air conditioner according to claim 1, wherein the control unit calculates the solar radiation thermal load by using a temperature of air inside the passenger compartment in addition to the temperature of the area close to the window.

21. (new) The air conditioner according to claim 20, wherein the control unit calculates the solar radiation thermal load by using a temperature of air outside the passenger compartment in addition to the temperature of air inside the passenger compartment and the temperature of the area close to the window.

22. (new) The air conditioner according to claim 1, wherein:
the environmental-condition detecting device further includes a solar radiation detecting means for detecting a solar radiation amount entering into the passenger compartment; and

the control unit calculates the solar radiation thermal load by using the solar radiation amount detected by the solar radiation detecting means in addition to the

temperature of the area close to the window.

23. (new) The air conditioner according to claim 1, wherein:

the operation portion includes an air temperature adjusting device for adjusting a temperature of conditioned air to be blown into the passenger compartment;

the control value of the operation portion is a set temperature for the conditioned air;

the control characteristic memory means stores a relationship between the set temperature and the solar radiation thermal load as the control characteristic; and

when the manual setting device manually changes the set temperature at a time, the control unit changes a set temperature calculated based on the solar radiation thermal load at this time among plural set temperatures stored in the control characteristic memory means.

24. (new) The air conditioner according to claim 1, wherein:

the operation portion further includes a blower for blowing conditioned air of the air conditioning unit into the passenger compartment;

the control value of the operation portion is a voltage applied to the blower;

the control characteristic memory means stores a relationship between the voltage applied to the blower and the solar radiation thermal load; and

when the manual setting device manually changes the voltage applied to

the blower at a time, the control unit changes a voltage calculated based on the solar radiation thermal load at this time among plural voltages stored in the control characteristic memory means.

25. (new) The air conditioner according to claim 20, wherein the temperature of air inside the passenger compartment is an average value of temperatures of the plural detection areas detected by the surface temperature detecting means.

26. (new) The air conditioner according to claim 20, further comprising
an inside air temperature detecting unit disposed to detect the temperature of air inside the passenger compartment.

27. (new) The air conditioner according to claim 1, wherein:
the environmental-condition detecting device detects a temperature of air outside the passenger compartment as the environmental condition;

the control characteristic memory means stores plural control values as control characteristics applied to the operation portion in accordance with the solar radiation thermal load and the temperature of air outside the passenger compartment;
and

when the manual setting device manually changes the control value at a time, the control unit changes a control value calculated at this time based on the solar radiation thermal load and the temperature of air outside the passenger compartment, among the plural control values stored in the control characteristic memory means.

28. (new) The air conditioner according to claim 1, wherein the control unit calculates the solar radiation thermal load based on an average value of temperatures of plural detection areas close to the window, among the temperatures of the detection areas detected by the surface temperature detecting means.